

REMARKS

As an initial matter, applicant thanks the Examiner for the courtesies extended to the undersigned in the telephone interview conducted on May 26, 2010.

Claims 1-20 are pending. By this Amendment, claims 1-5, 7, 9, 11-15 and 19 have been amended to clarify the claimed subject matter. Claims 1-20 remain pending upon entry of this Amendment, with claims 1 and 11 being in independent form.

Applicant appreciates the statement in page 2 of the Office Action that certain objections and rejections have been overcome, and addresses below the remaining rejections.

Claims 1, 3, 6, 11, 13 and 16 – New Ground of Rejection

Claims 1, 3, 6, 11, 13 and 16 were rejected under 35 U.S.C. § 102(a) as purportedly anticipated by newly cited Oosawa (US 7,616,789).

As discussed in the May 26, 2010 telephone interview, Oosawa is directed to a fundamentally different approach than that of the claimed subject matter of the present application.

The approach in the subject application is to compare geometric parameters of images of patient organs with geometric parameters of templates generated from a large population of images of organs (of other patients) that are believed to be normal.

In contrast, the Oosawa approach, as understood, is to subtract from each other the pixel values of an image of a patient organ and an image of a normal organ, after warping the image of the patient organ to fit the outlines of the normal image. No comparison of sets of geometric parameters as recited in these claims is taught in Oosawa, and no such comparison is suggested by Oosawa's subtraction of pixel values.

As seen in the example of Figs. 4-6 in the subject application, a bronchial bifurcation seen in Fig. 4 is imaged to produce sectional images 42. Distances between corresponding points in the branches are measured, as illustrated in Fig. 5, to thereby generate a set of deformation geometric parameters defining a curve 60 in Fig. 6. These geometric parameters are not pixel values of an image – they are simply distances between the bronchial branches in different sections. This set of deformation geometric parameters is compared with a template of reference geometric parameters defining the curve 61 in Fig. 6. These reference geometric parameters also are not pixel values of an image. The fact that curve 60 is inside curve 61 indicates that the imaged bronchi of the patient are normal. An abnormality (e.g., a tumor) is indicated when the measurements from another patient image define a curve 62 in Fig. 6, which is outside curve 61. Other disclosed embodiments use other sets of geometric parameters.

In contrast, Oosawa proposes subtracting the pixel values of two images from each other to determine the presence of an abnormality. It does not teach the comparison of sets of geometric parameters that are not pixel values.

For example, Oosawa Figs. 9A-9C illustrate that the pixel values of a medical image P and a normal structure image Pc are subtracted from each other to generate a subtraction pixel image Psu in which an abnormality L is highlighted (because it is present in the patient image P but not in the normal image Pc). According to Oosawa, “the pixel values of the pixels in the normal structure image Pc are subtracted from the pixel values of the corresponding pixels in the medical image P.” Oosawa, column 17, lines 17-19.

The independent claims presented hereby, namely, claims 1 and 11, recite the comparison of geometric parameters of organ regions and of normal shapes, and thus are directed to a device and a method that differ at least in this fundamental respect from Oosawa’s subtraction of pixel

values of two pixel images.

It is submitted that the approach of the subject application is not only different but also is more advantageous than that of Oosawa since the approach of the present application involves operations that are simpler and likely to be more accurate as they do not involve the complicated warping of the patient image that Oosawa proposes.

Claims 2, 4, 5, 7, 9, 12, 14, 15, 17 and 19 – New Ground of Rejection

Claims 2, 4, 5, 7, 9, 12, 14, 15, 17 and 19 were rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over newly cited Oosawa in view of Greenberg (US 6,301,498).

Claims 2, 4, 5, 7, 9, 12, 14, 15, 17 and 19 are dependent claims and differ from Oosawa at least for the reasons discussed for their respective parent claims 1 and 11.

Greenberg does not supply the teachings missing in Oosawa. Greenberg, as understood, pertains to comparing portions of the same artery with each other rather than comparing parameters of a patient organ with reference parameters from sources other than the patient's image.

Greenberg shows in Fig. 1 a prior art method of detecting arterial stenosis by looking at internal diameter variations seen in the silhouette of a two-dimensional image of an artery, and states "Our invention, unlike prior art devices, makes use of the three-dimensional information ... as well as the two-dimensional information provided by the silhouette." Greenberg, column 4, lines 2-5. The three-dimensional information still is from an image of the same artery. No comparison of sets of geometric parameters from a patient image and a normal image derived from other sources is disclosed.

Accordingly, it is submitted that the combination of Oosawa and Greenberg does not


suggest the inventions recited in independent claims 1 and 11, and in the dependent claims depending therefrom, at least for the reasons discussed above.

In view of the remarks hereinabove, applicant submits that the application is now allowable, and earnestly solicits the allowance of the application.

However, if the Examiner can suggest a further amendment that would advance this application to condition for allowance, the Examiner is respectfully requested to call the undersigned attorney.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Patent Office is hereby authorized to charge any required fees in connection with this amendment, and to credit any overpayment, to our Deposit Account No. 03-3125.

Respectfully submitted,



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